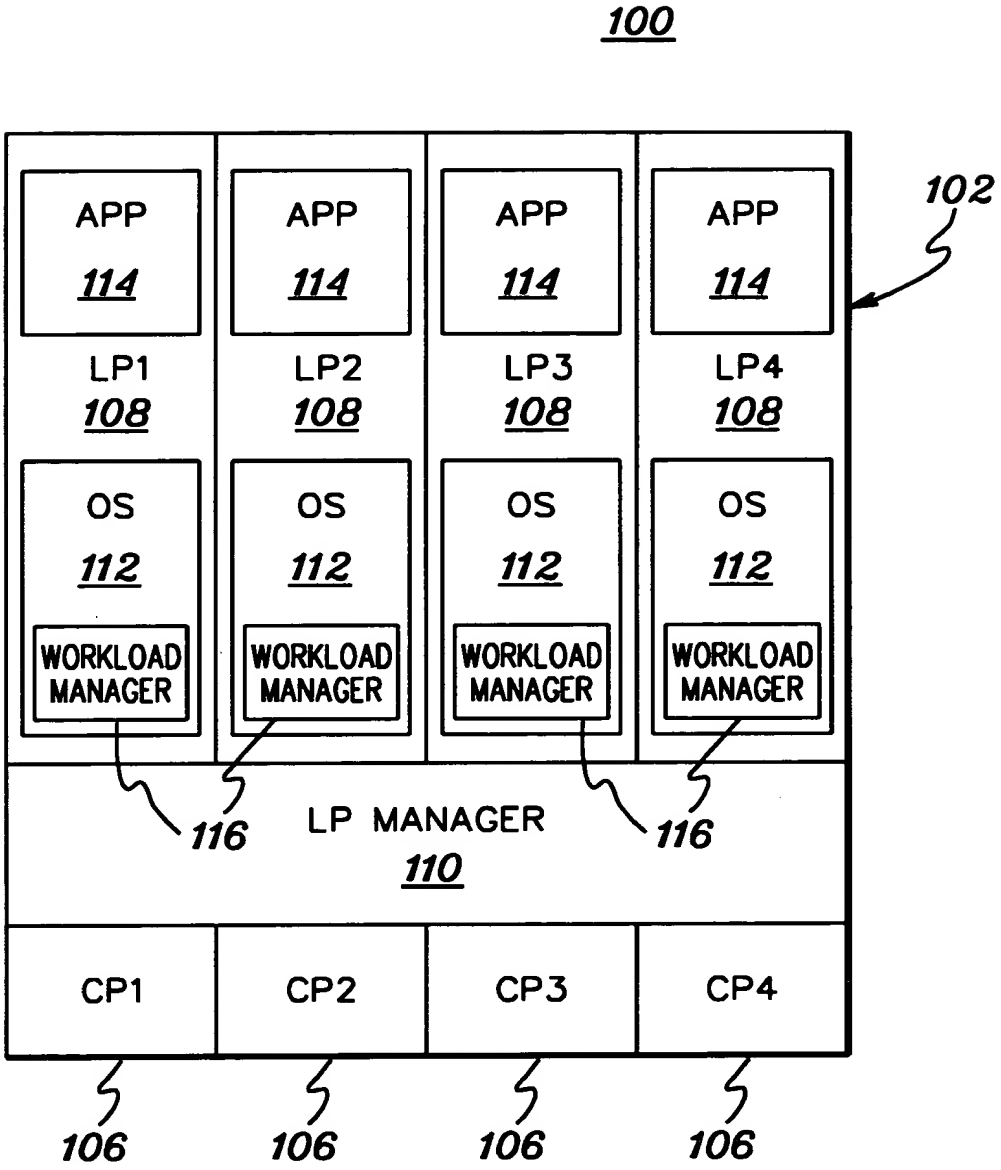

100
102
APP
114
APP
114
APP
114
APP
114
LP1
108
LP2
108
LP3
108
LP4
108
OS
112
OS
112
OS
112
OS
112
WORKLOAD MANAGER
WORKLOAD MANAGER
WORKLOAD MANAGER
WORKLOAD MANAGER
116
LP MANAGER
110
116
CP1
CP2
CP3
CP4
106
106
106
106

fig. 1A

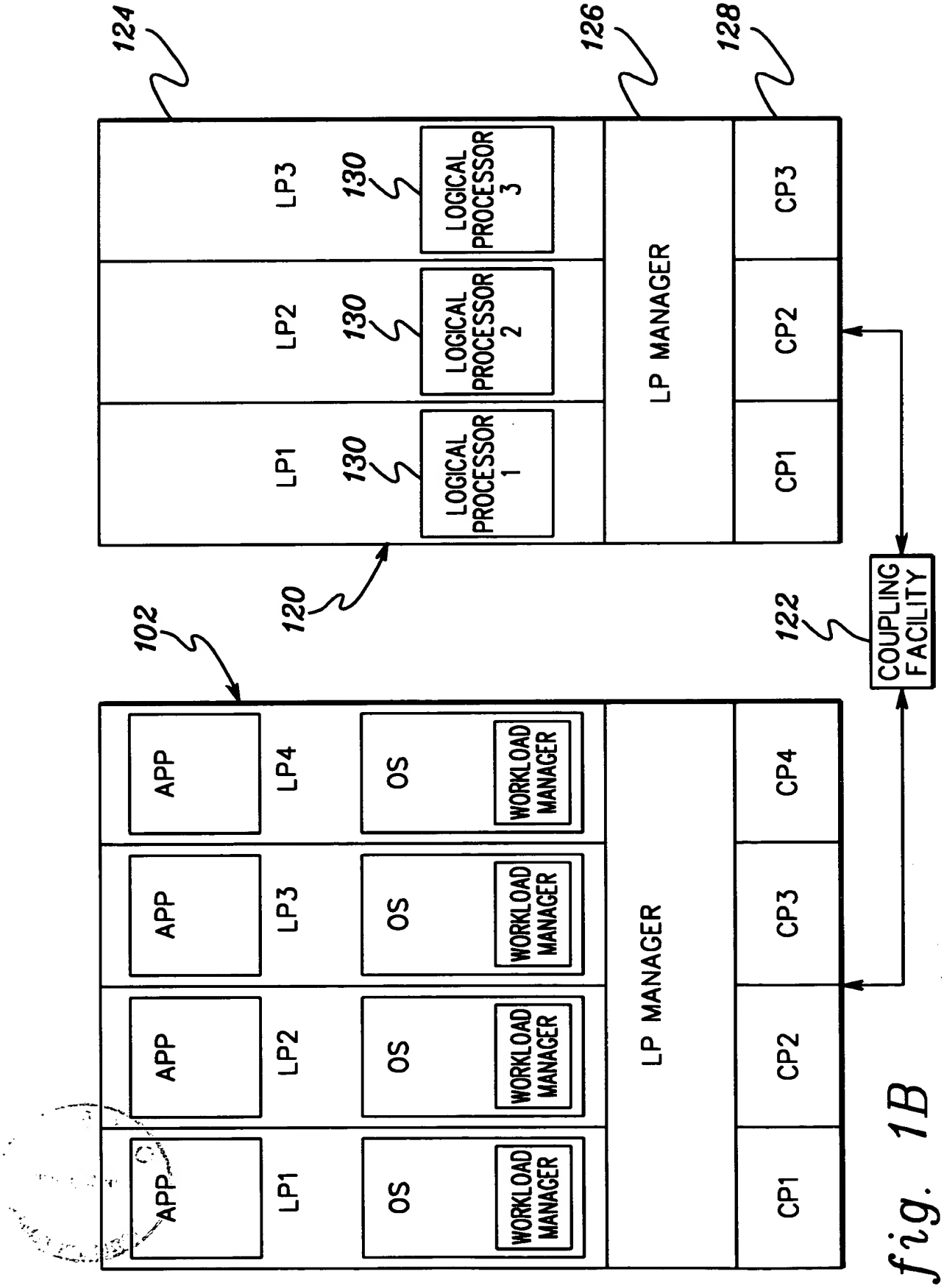

124
126
128
LP3
LP2
LP1
130
LOGICAL PROCESSOR 3
LOGICAL PROCESSOR 2
LOGICAL PROCESSOR 1
LP MANAGER
CP3
CP2
CP1
120
102
122
COUPLING FACILITY
APP
LP4
LP3
LP2
LP1
OS
WORKLOAD MANAGER
LP MANAGER
CP4
CP3
CP2
CP1

fig. 1B

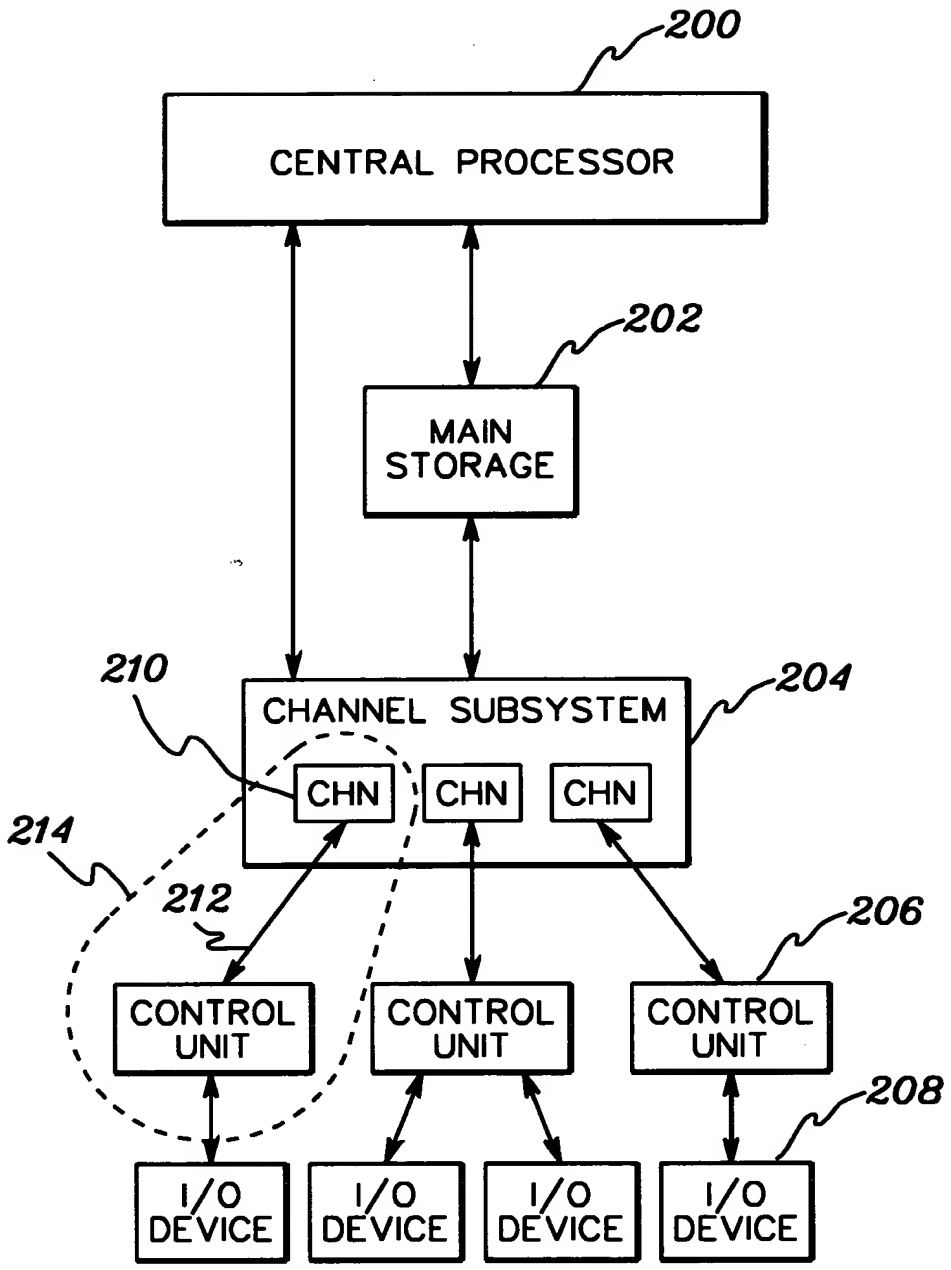

200
CENTRAL PROCESSOR
202
MAIN STORAGE
210
CHANNEL SUBSYSTEM
204
CHN
CHN
CHN
214
212
206
CONTROL UNIT
CONTROL UNIT
CONTROL UNIT
208
I/O DEVICE
I/O DEVICE
I/O DEVICE
I/O DEVICE

fig. 2

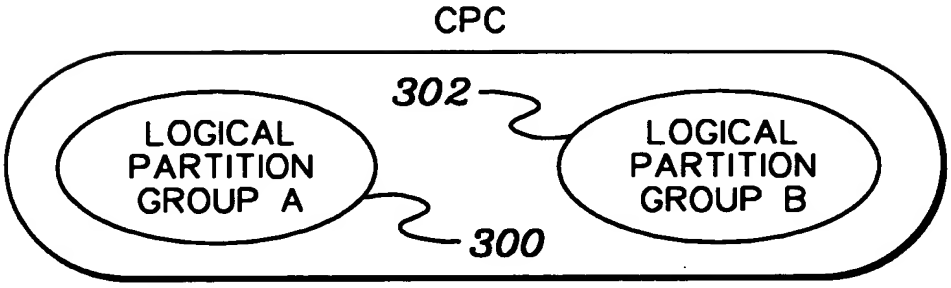

CPC
302
LOGICAL PARTITION GROUP A
LOGICAL PARTITION GROUP B
300

fig. 3

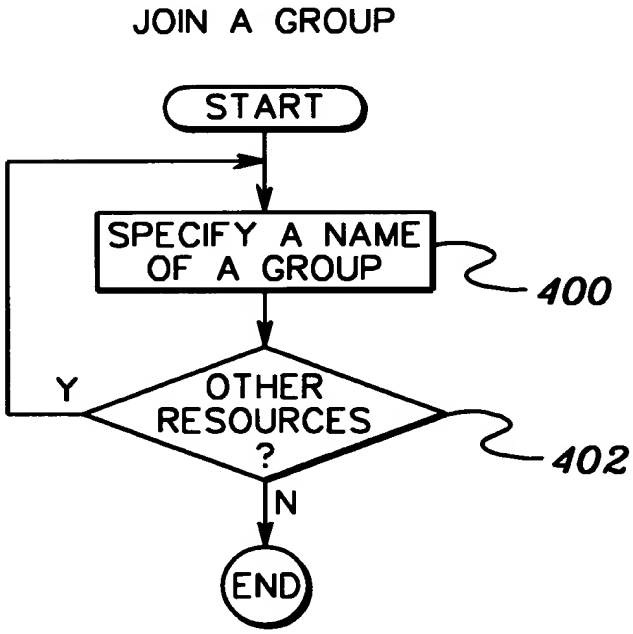

JOIN A GROUP
START
SPECIFY A NAME OF A GROUP
400
Y
OTHER RESOURCES ?
402
N
END

fig. 4A

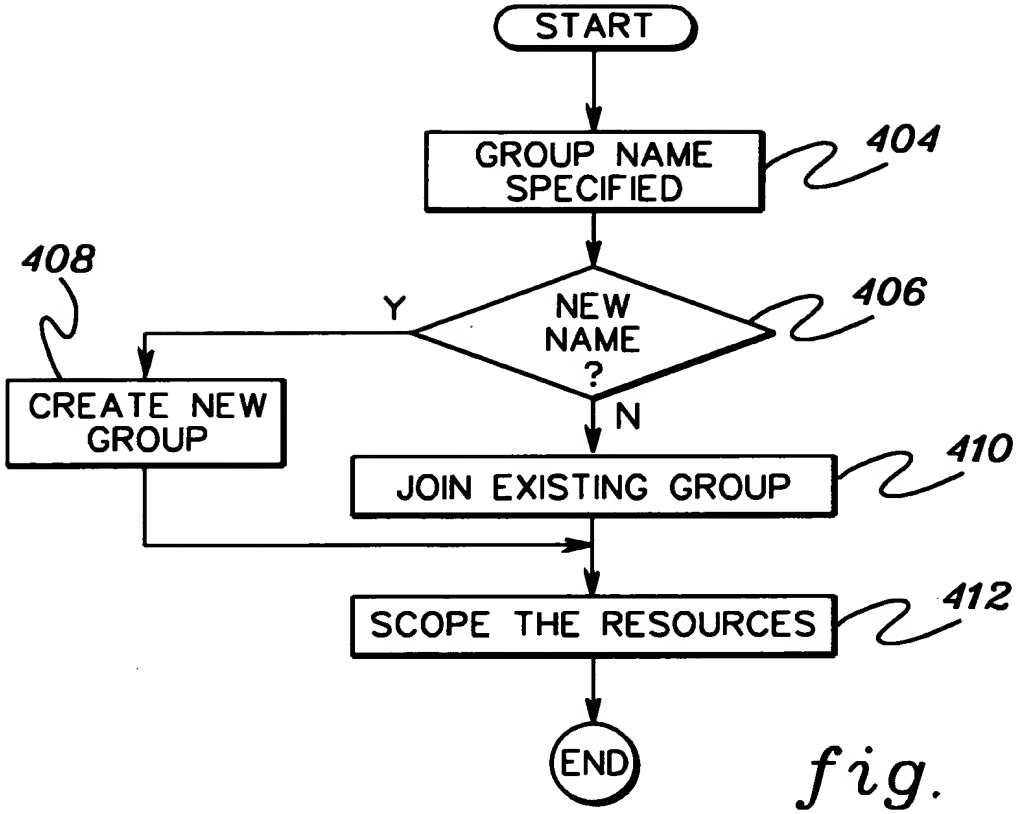

START
GROUP NAME SPECIFIED
404
NEW NAME ?
406
Y
N
408
CREATE NEW GROUP
JOIN EXISTING GROUP
410
SCOPE THE RESOURCES
412
END

fig. 4B

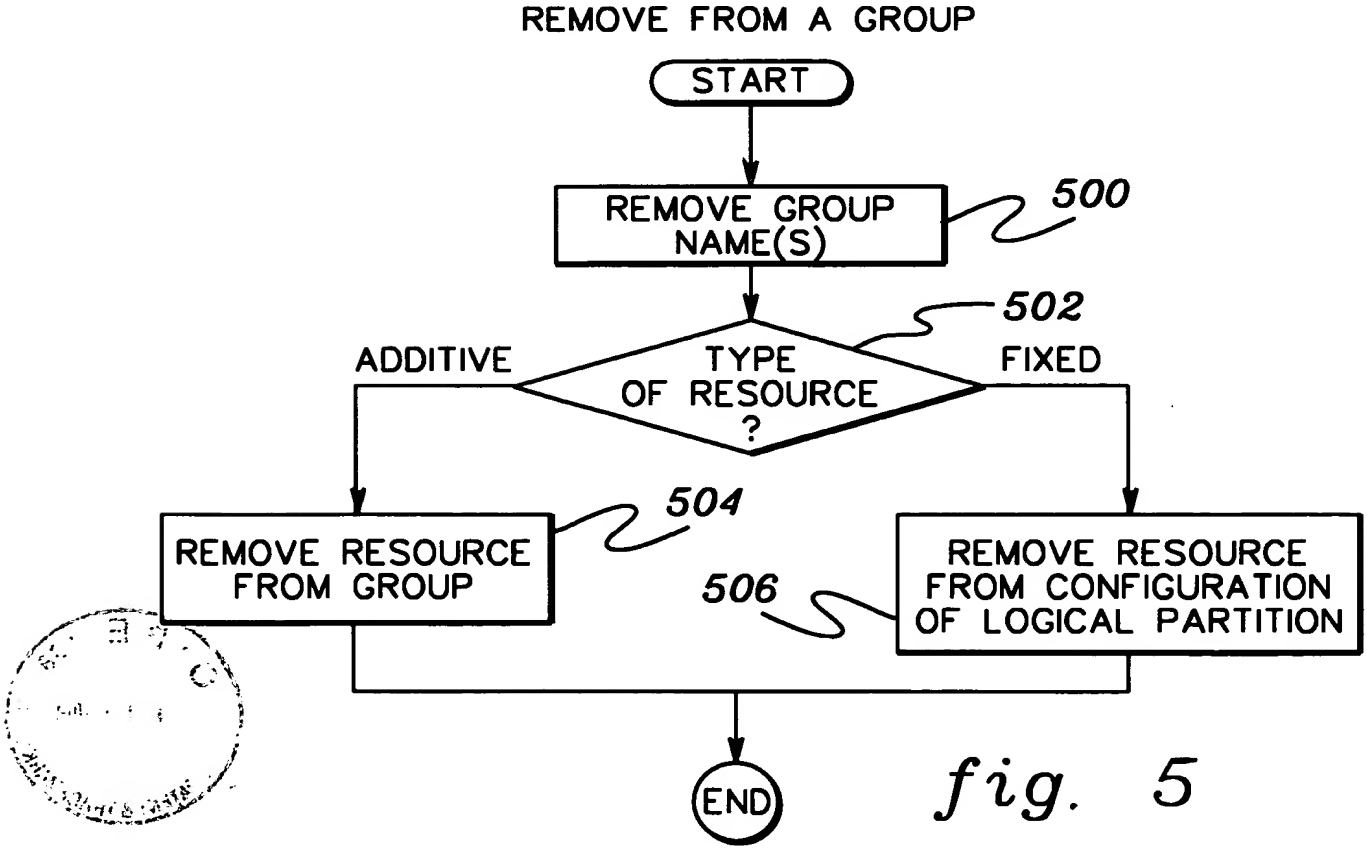

REMOVE FROM A GROUP
START
REMOVE GROUP NAME(S)
500
TYPE OF RESOURCE ?
502
ADDITIVE
FIXED
REMOVE RESOURCE FROM GROUP
504
REMOVE RESOURCE FROM CONFIGURATION OF LOGICAL PARTITION
506
END

fig. 5

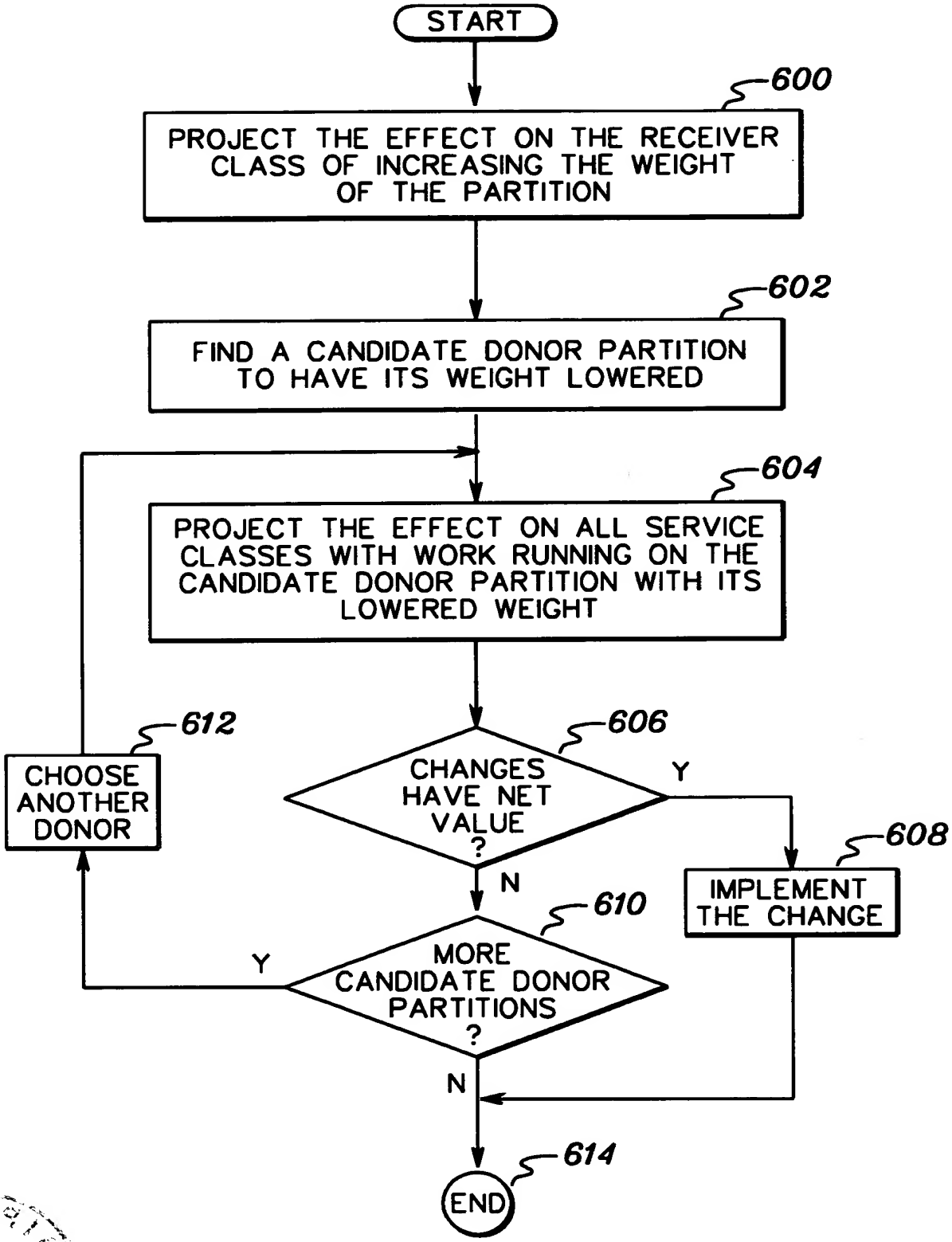

START
600
PROJECT THE EFFECT ON THE RECEIVER CLASS OF INCREASING THE WEIGHT OF THE PARTITION
602
FIND A CANDIDATE DONOR PARTITION TO HAVE ITS WEIGHT LOWERED
604
PROJECT THE EFFECT ON ALL SERVICE CLASSES WITH WORK RUNNING ON THE CANDIDATE DONOR PARTITION WITH ITS LOWERED WEIGHT
606
CHANGES HAVE NET VALUE ?
Y
N
608
IMPLEMENT THE CHANGE
610
MORE CANDIDATE DONOR PARTITIONS ?
Y
N
612
CHOOSE ANOTHER DONOR
614
END

fig. 6

DYNAMIC ADJUSTMENT OF CONFIGURATION OF LOGICAL PROCESSORS

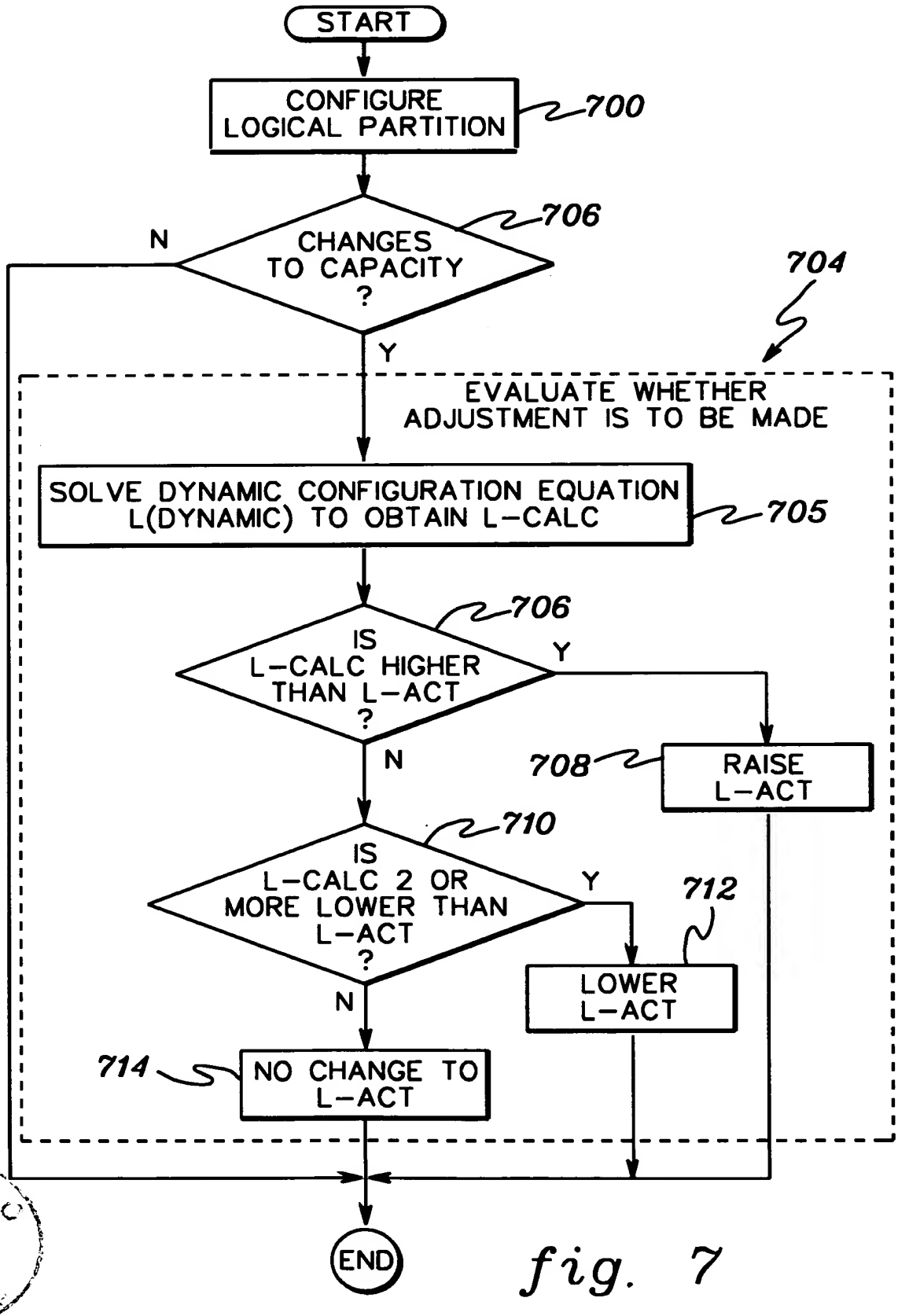


fig. 7

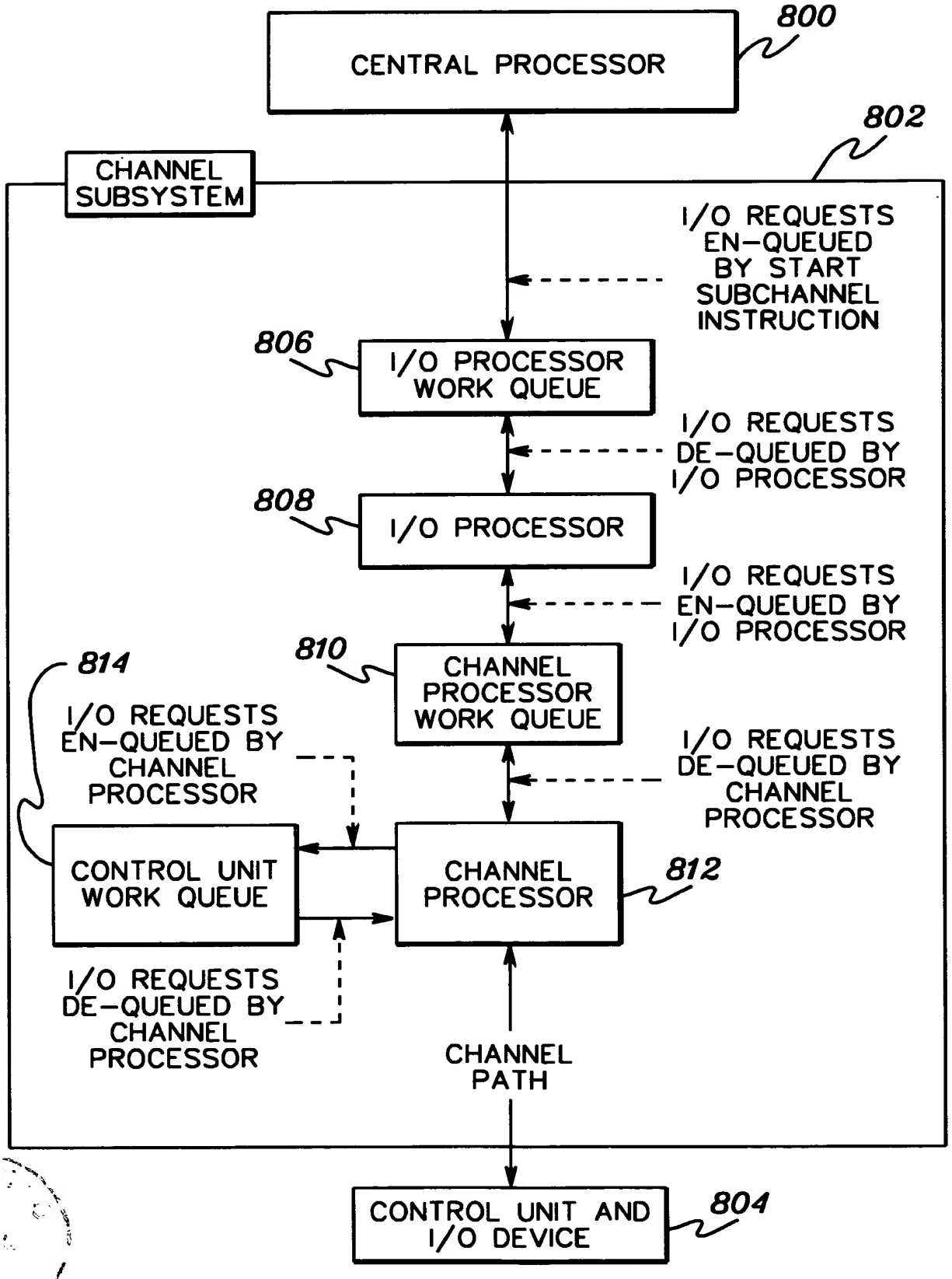

800
CENTRAL PROCESSOR
802
CHANNEL SUBSYSTEM
I/O REQUESTS EN-QUEUED BY START SUBCHANNEL INSTRUCTION
806
I/O PROCESSOR WORK QUEUE
I/O REQUESTS DE-QUEUED BY I/O PROCESSOR
808
I/O PROCESSOR
I/O REQUESTS EN-QUEUED BY I/O PROCESSOR
810
CHANNEL PROCESSOR WORK QUEUE
814
I/O REQUESTS EN-QUEUED BY CHANNEL PROCESSOR
I/O REQUESTS DE-QUEUED BY CHANNEL PROCESSOR
CONTROL UNIT WORK QUEUE
CHANNEL PROCESSOR
812
I/O REQUESTS DE-QUEUED BY CHANNEL PROCESSOR
CHANNEL PATH
CONTROL UNIT AND I/O DEVICE
804

fig. 8

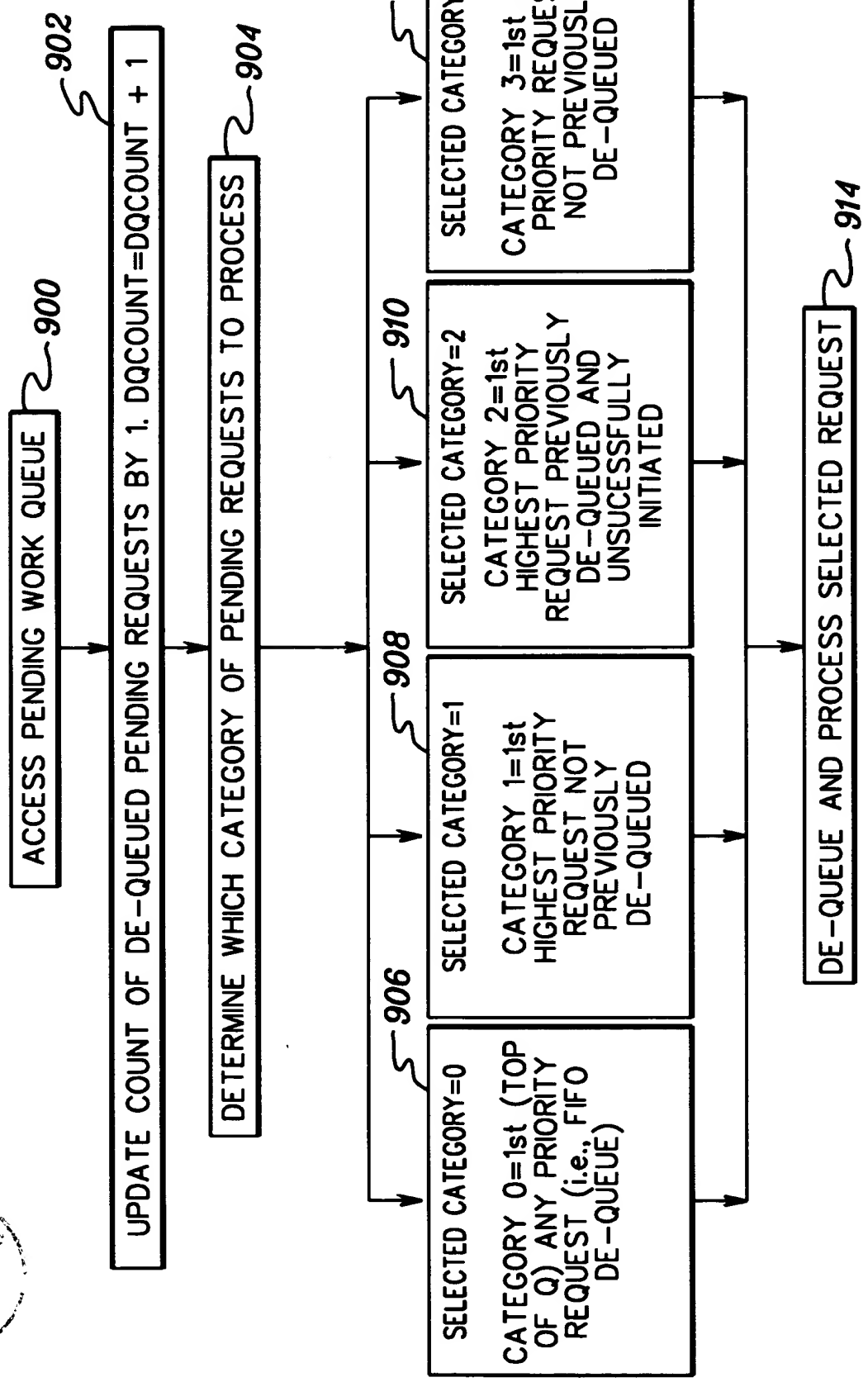

ACCESS PENDING WORK QUEUE
900
UPDATE COUNT OF DE-QUEUED PENDING REQUESTS BY 1. DQCOUNT=DQCOUNT + 1
902
DETERMINE WHICH CATEGORY OF PENDING REQUESTS TO PROCESS
904
SELECTED CATEGORY=0
CATEGORY 0=1st (TOP OF Q) ANY PRIORITY REQUEST (i.e., FIFO DE-QUEUE)
906
SELECTED CATEGORY=1
CATEGORY 1=1st HIGHEST PRIORITY REQUEST NOT PREVIOUSLY DE-QUEUED
908
SELECTED CATEGORY=2
CATEGORY 2=1st HIGHEST PRIORITY REQUEST PREVIOUSLY DE-QUEUED AND UNSUCESSFULLY INITIATED
910
SELECTED CATEGORY=3
CATEGORY 3=1st ANY PRIORITY REQUEST NOT PREVIOUSLY DE-QUEUED
912
DE-QUEUE AND PROCESS SELECTED REQUEST
914

fig. 9

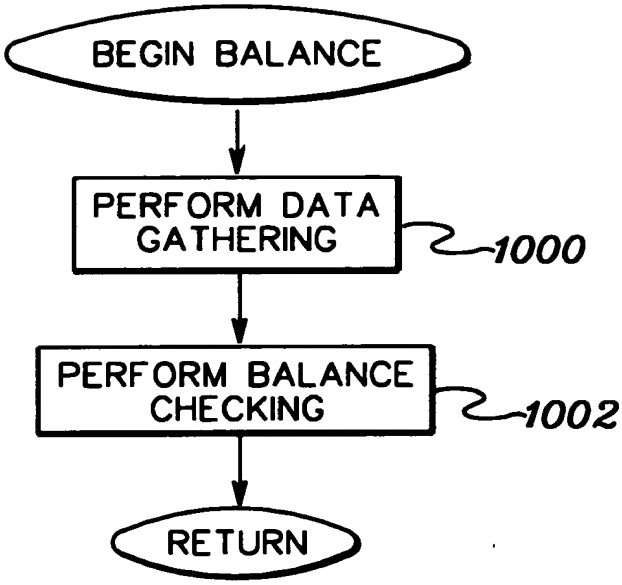

BEGIN BALANCE
PERFORM DATA GATHERING
1000
PERFORM BALANCE CHECKING
1002
RETURN

fig. 10

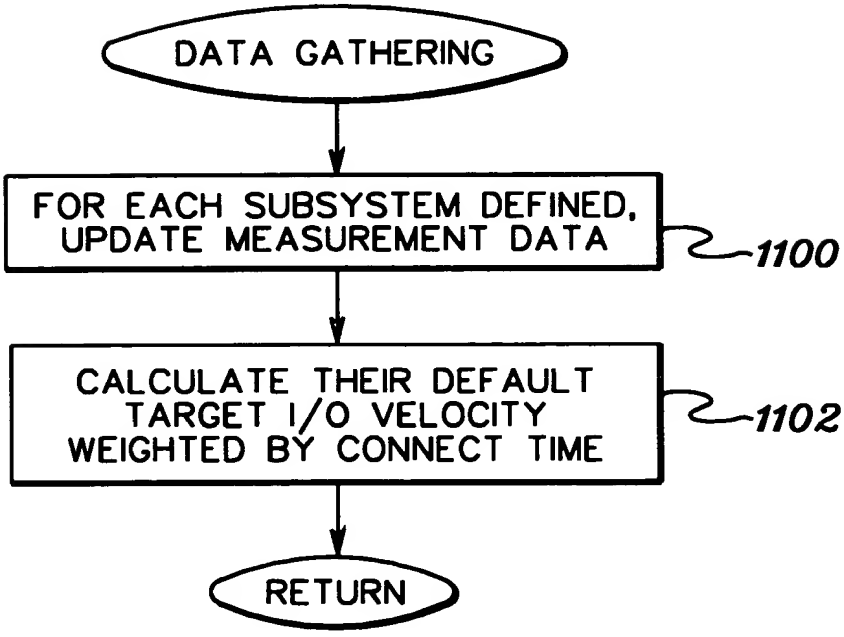
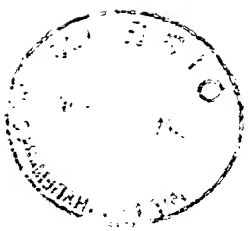

DATA GATHERING
FOR EACH SUBSYSTEM DEFINED, UPDATE MEASUREMENT DATA
1100
CALCULATE THEIR DEFAULT TARGET I/O VELOCITY WEIGHTED BY CONNECT TIME
1102
RETURN

fig. 11



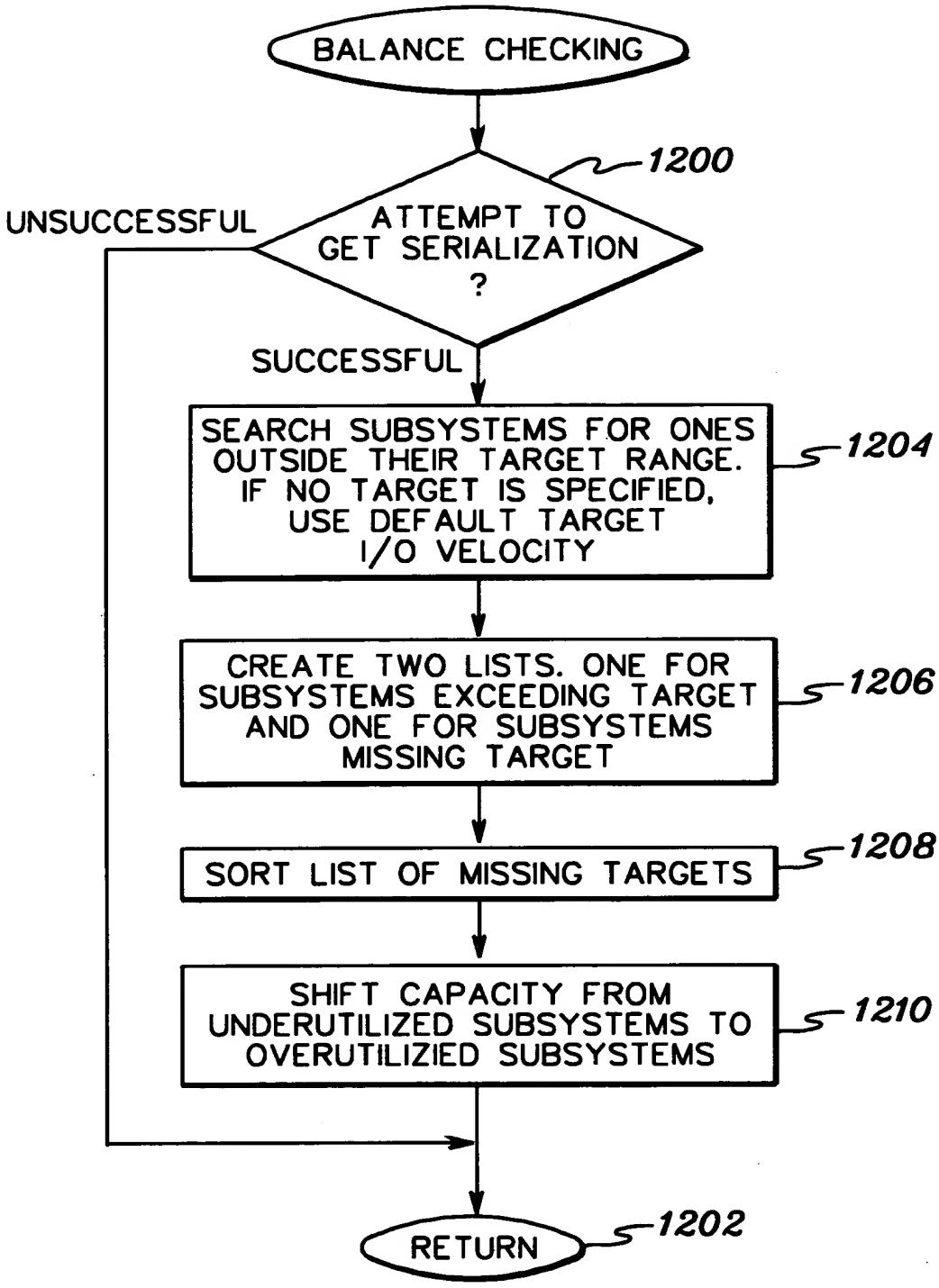
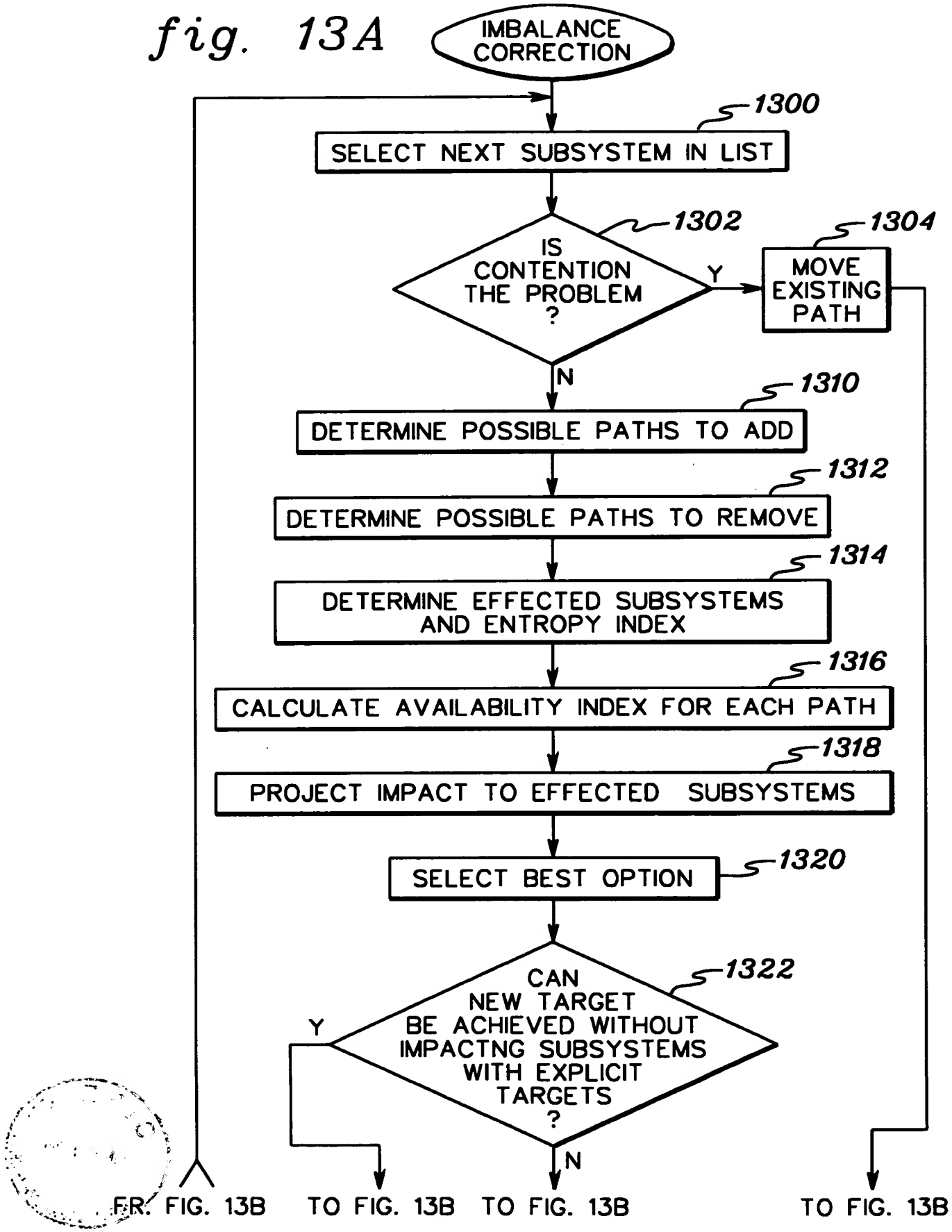

BALANCE CHECKING
1200
ATTEMPT TO GET SERIALIZATION ?
UNSUCCESSFUL
SUCCESSFUL
SEARCH SUBSYSTEMS FOR ONES OUTSIDE THEIR TARGET RANGE. IF NO TARGET IS SPECIFIED, USE DEFAULT TARGET I/O VELOCITY
1204
CREATE TWO LISTS. ONE FOR SUBSYSTEMS EXCEEDING TARGET AND ONE FOR SUBSYSTEMS MISSING TARGET
1206
SORT LIST OF MISSING TARGETS
1208
SHIFT CAPACITY FROM UNDERUTILIZED SUBSYSTEMS TO OVERUTILIZIED SUBSYSTEMS
1210
RETURN
1202

fig. 12

fig. 13A


IMBALANCE CORRECTION
1300
SELECT NEXT SUBSYSTEM IN LIST
1302
IS CONTENTION THE PROBLEM ?
Y
1304
MOVE EXISTING PATH
N
1310
DETERMINE POSSIBLE PATHS TO ADD
1312
DETERMINE POSSIBLE PATHS TO REMOVE
1314
DETERMINE EFFECTED SUBSYSTEMS AND ENTROPY INDEX
1316
CALCULATE AVAILABILITY INDEX FOR EACH PATH
1318
PROJECT IMPACT TO EFFECTED SUBSYSTEMS
1320
SELECT BEST OPTION
1322
CAN NEW TARGET BE ACHIEVED WITHOUT IMPACTNG SUBSYSTEMS WITH EXPLICIT TARGETS ?
Y
N
FR. FIG. 13B
TO FIG. 13B
TO FIG. 13B
TO FIG. 13B

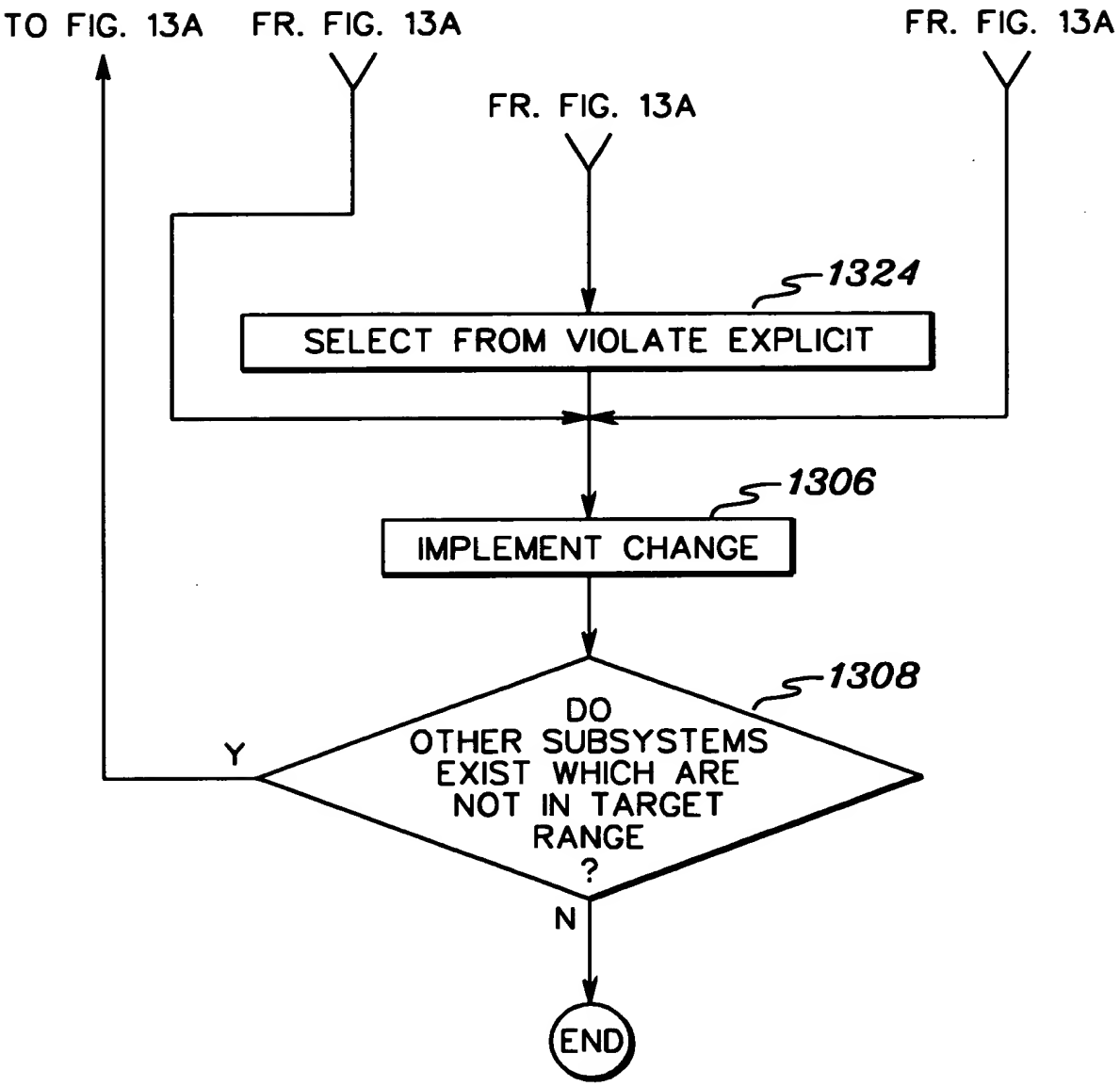

TO FIG. 13A
FR. FIG. 13A
FR. FIG. 13A
FR. FIG. 13A
1324
SELECT FROM VIOLATE EXPLICIT
1306
IMPLEMENT CHANGE
1308
DO OTHER SUBSYSTEMS EXIST WHICH ARE NOT IN TARGET RANGE ?
Y
N
END

fig. 13B

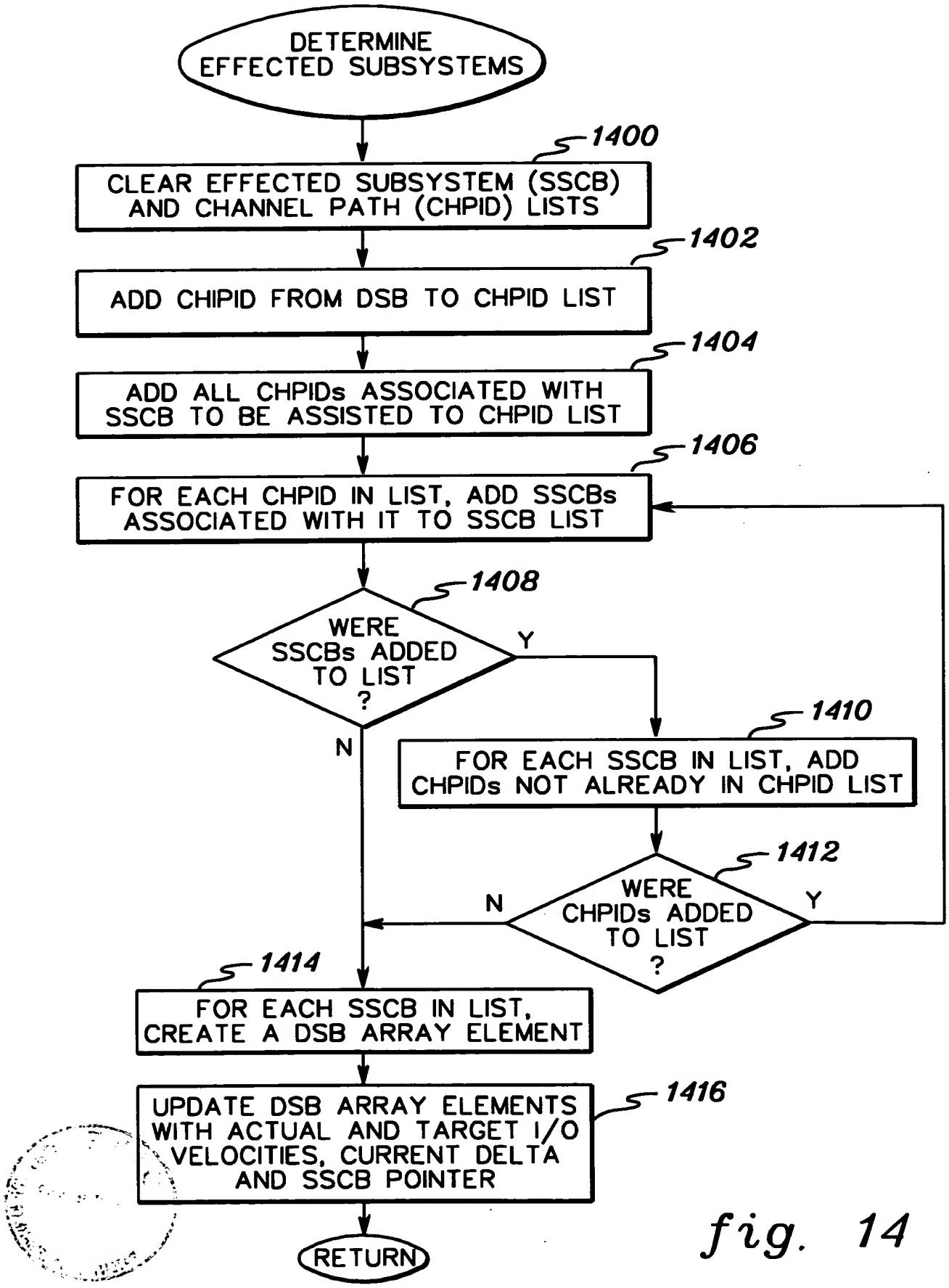

DETERMINE EFFECTED SUBSYSTEMS
1400
CLEAR EFFECTED SUBSYSTEM (SSCB) AND CHANNEL PATH (CHPID) LISTS
1402
ADD CHIPID FROM DSB TO CHPID LIST
1404
ADD ALL CHPIDs ASSOCIATED WITH SSCB TO BE ASSISTED TO CHPID LIST
1406
FOR EACH CHPID IN LIST, ADD SSCBs ASSOCIATED WITH IT TO SSCB LIST
1408
WERE SSCBs ADDED TO LIST ?
Y
N
1410
FOR EACH SSCB IN LIST, ADD CHPIDs NOT ALREADY IN CHPID LIST
1412
WERE CHPIDs ADDED TO LIST ?
N
Y
1414
FOR EACH SSCB IN LIST, CREATE A DSB ARRAY ELEMENT
1416
UPDATE DSB ARRAY ELEMENTS WITH ACTUAL AND TARGET I/O VELOCITIES, CURRENT DELTA AND SSCB POINTER
RETURN

fig. 14

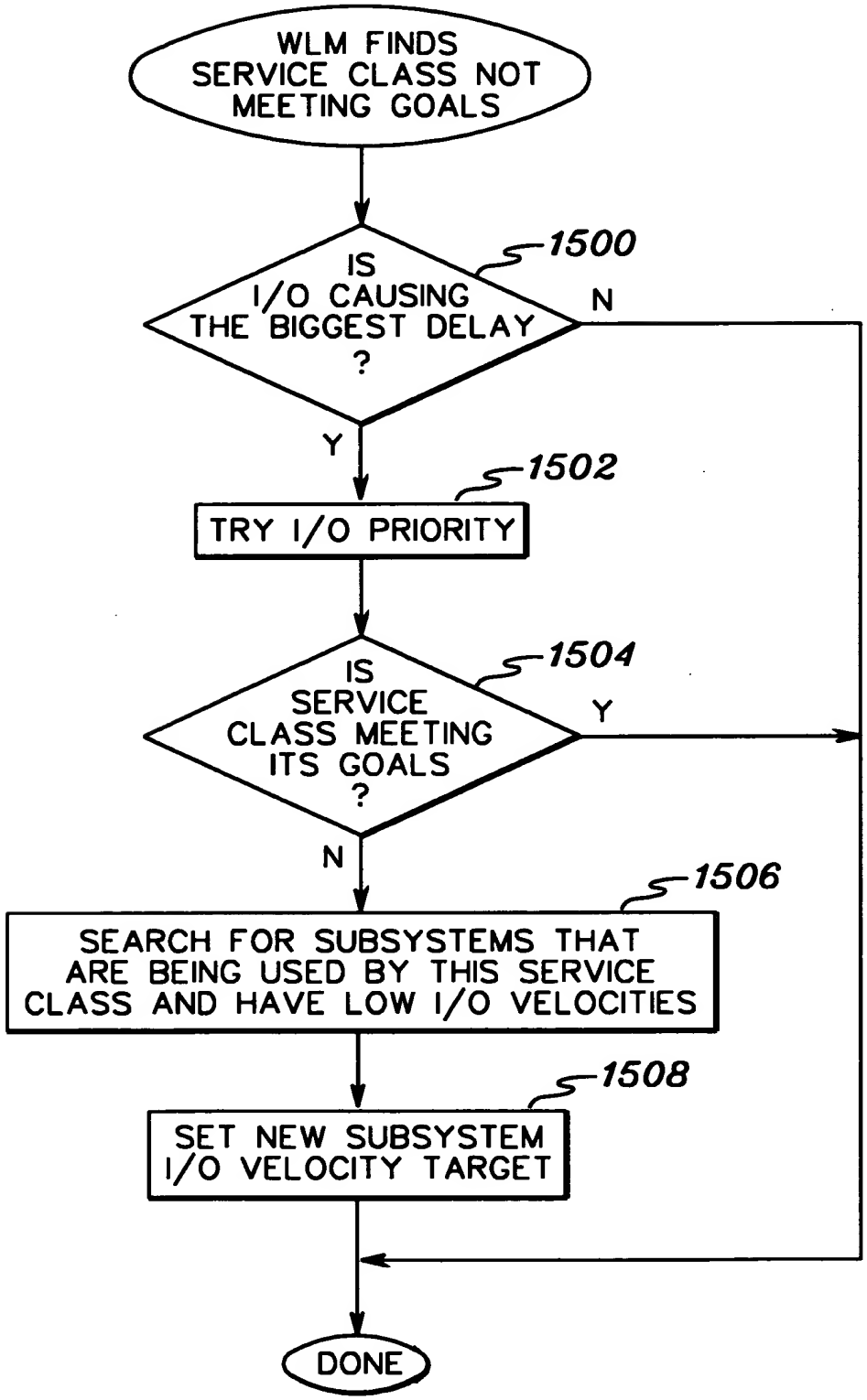

WLM FINDS SERVICE CLASS NOT MEETING GOALS
1500
IS I/O CAUSING THE BIGGEST DELAY ?
N
Y
1502
TRY I/O PRIORITY
1504
IS SERVICE CLASS MEETING ITS GOALS ?
Y
N
1506
SEARCH FOR SUBSYSTEMS THAT ARE BEING USED BY THIS SERVICE CLASS AND HAVE LOW I/O VELOCITIES
1508
SET NEW SUBSYSTEM I/O VELOCITY TARGET
DONE

fig. 15

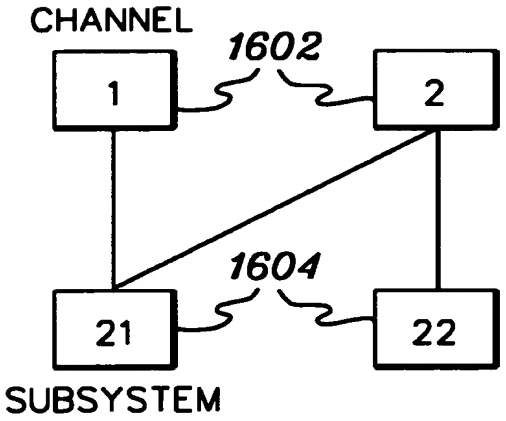


fig. 16A

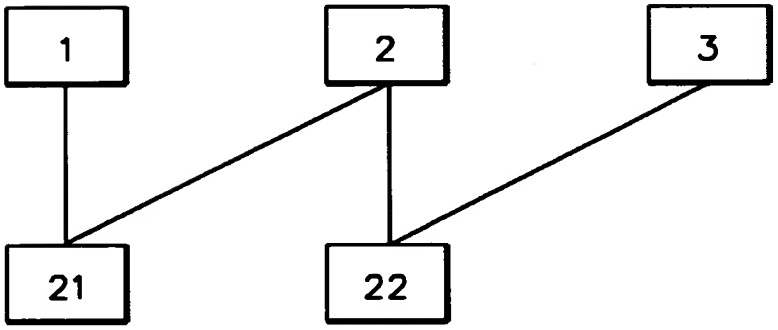


fig. 16B

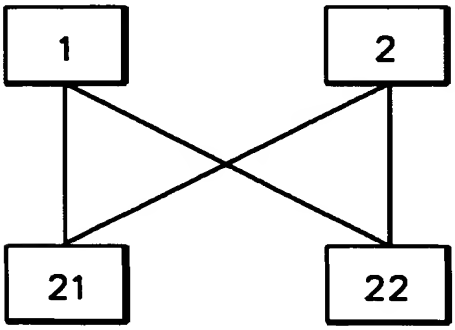


fig. 16C

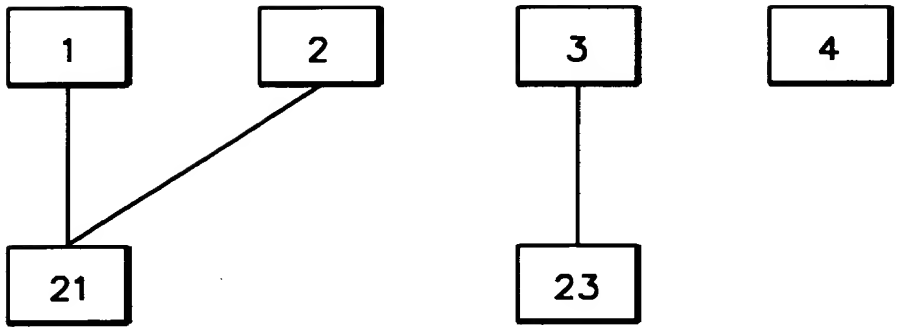


fig. 17A

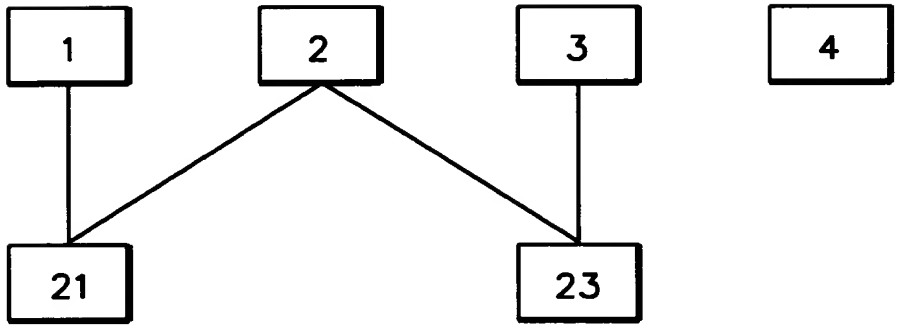


fig. 17B

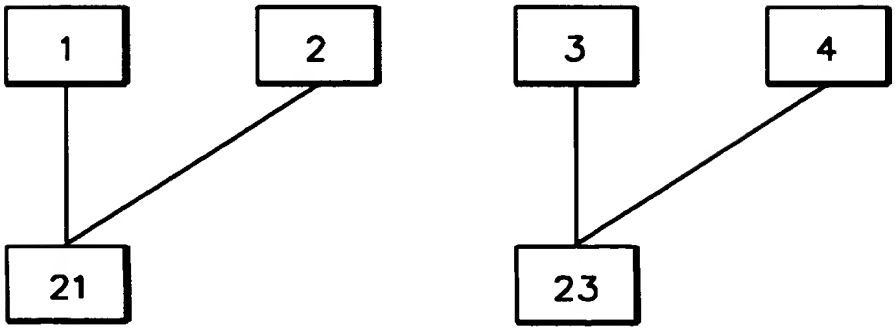


fig. 17C

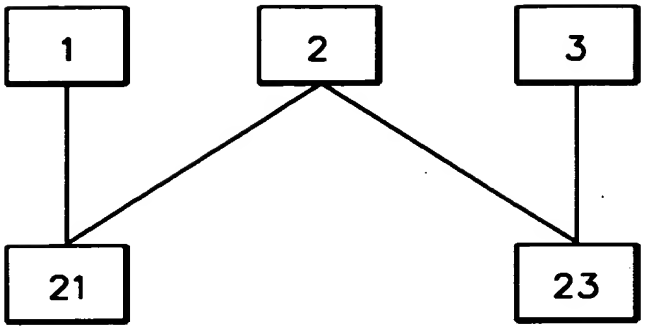


fig. 18A

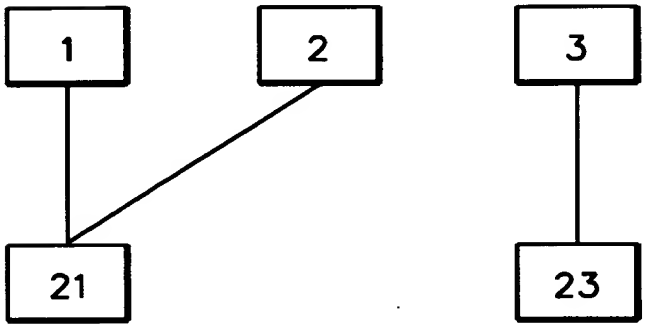


fig. 18B

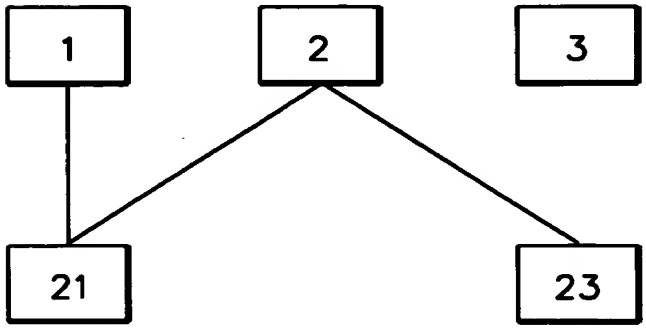


fig. 18C

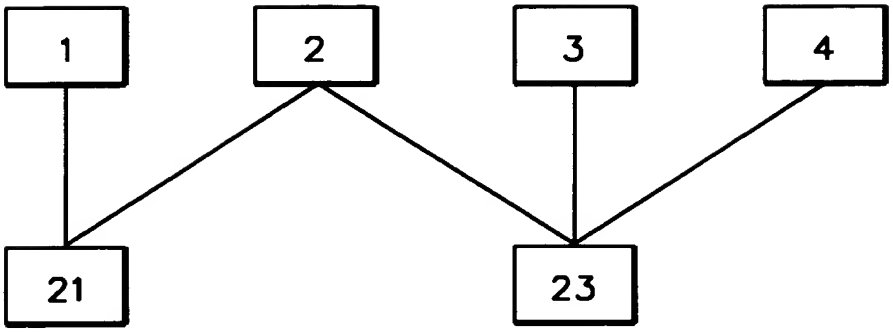


fig. 19A

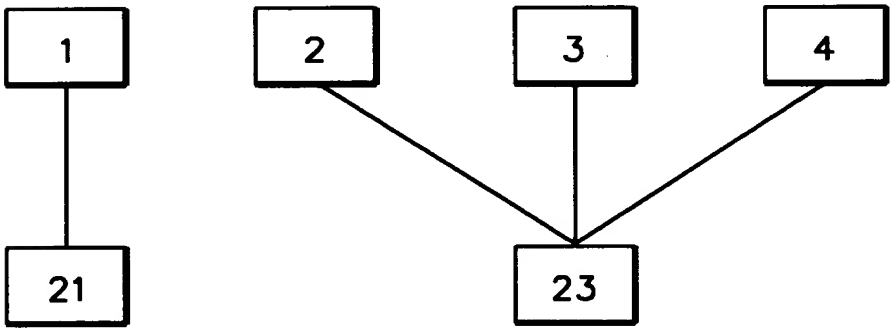


fig. 19B

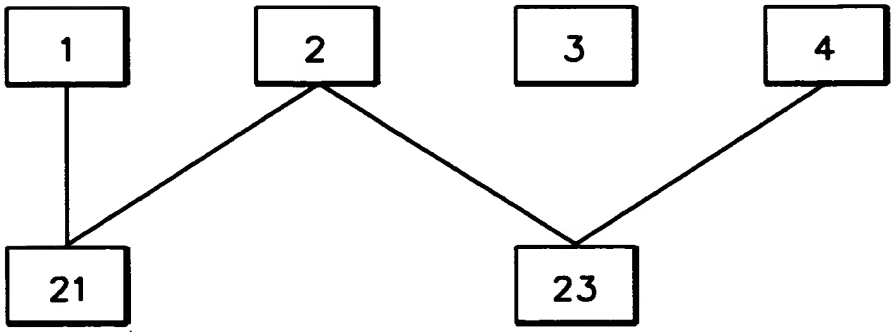


fig. 19C

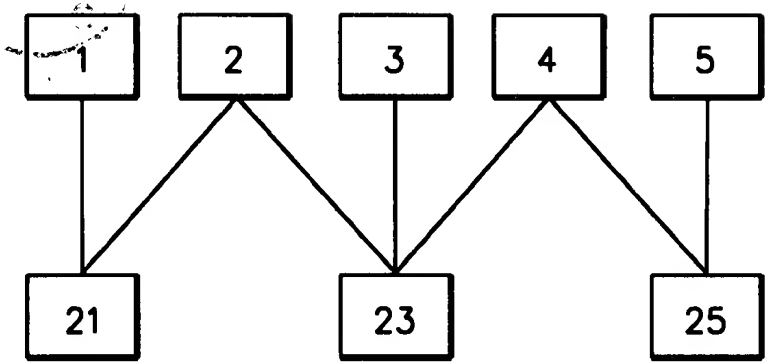


fig. 20A

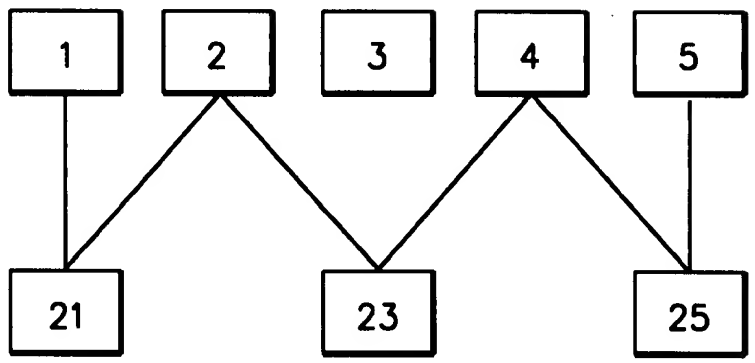


fig. 20B

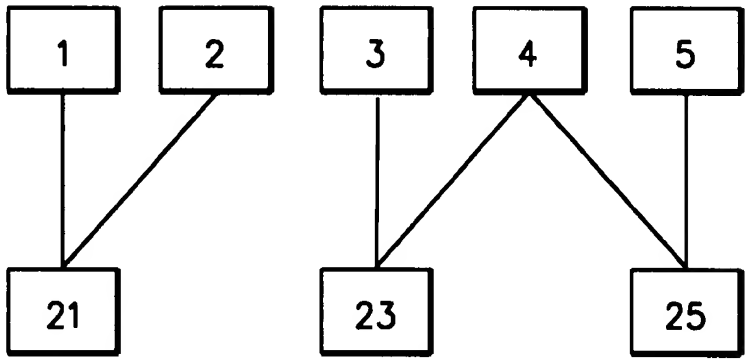


fig. 20C

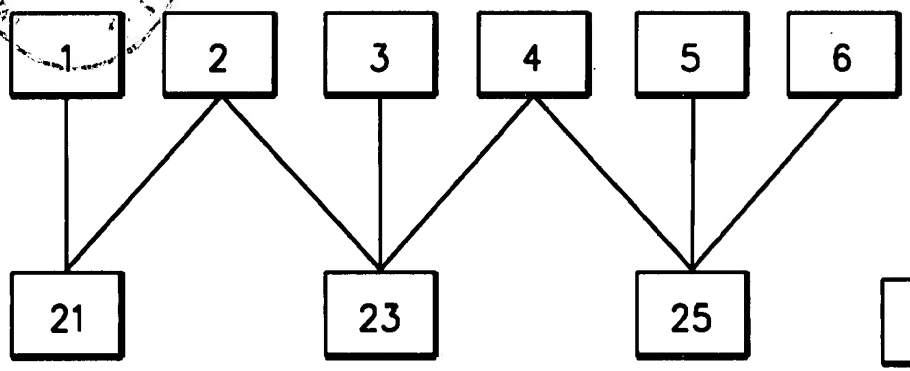


fig. 21A

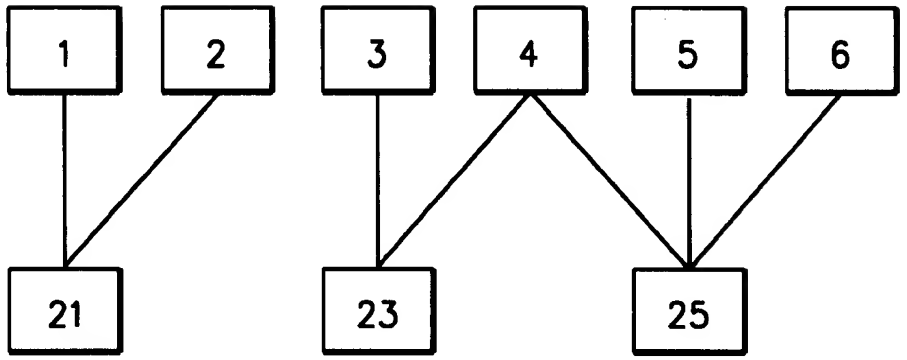


fig. 21B

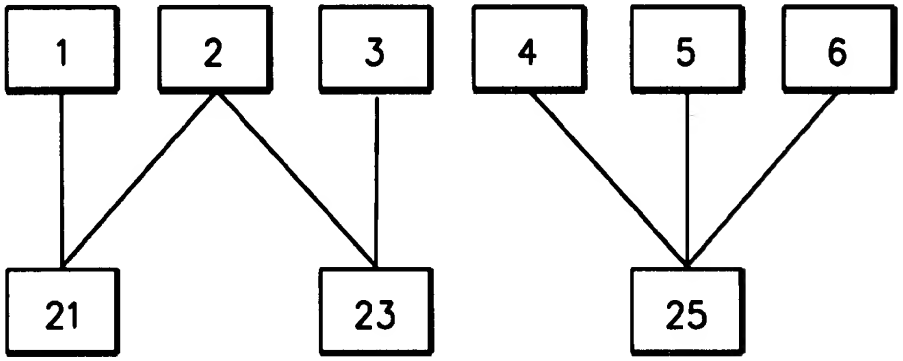


fig. 21C

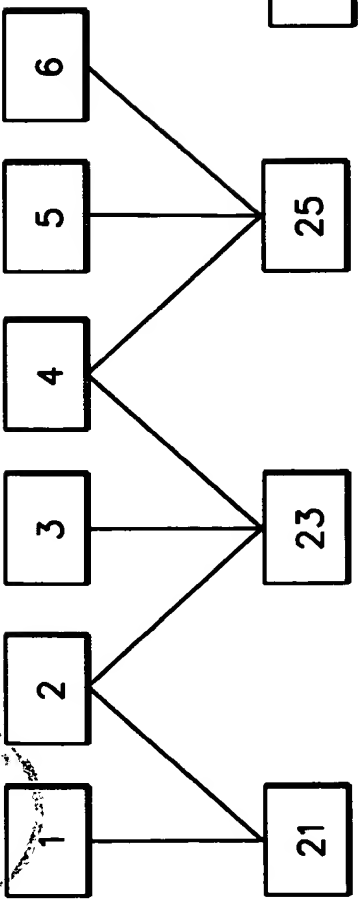


fig. 22A

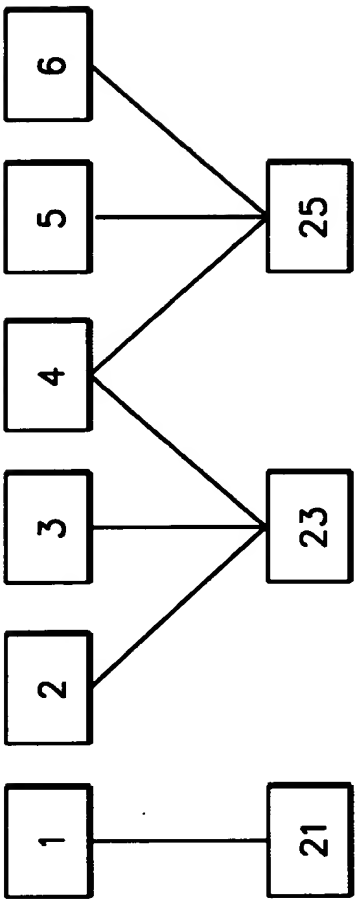


fig. 22B

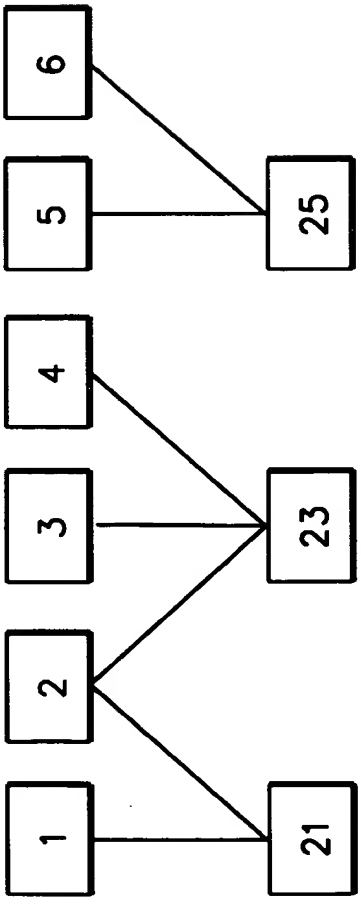


fig. 22C